

(21) Application No: 0219295.3

(22) Date of Filing: 19.08.2002

(71) Applicant(s):
Minds Eye 3D Lighting Design Limited
(Incorporated in the United Kingdom)
2 & 3 Huguenot Place, LONDON, E1 5LN,
United Kingdom

(72) Inventor(s):
Douglas James
Daniel Heap
Jonathan Warren

(74) Agent and/or Address for Service:
Boulton Watt
Verulam Gardens, 70 Gray's Inn Road,
LONDON, WC1X 8BT, United Kingdom

(51) INT CL⁷:
F21S 8/02 8/04 // F21W 131:30

(52) UK CL (Edition W):
F4R RCM R325 R45X R501 R511

(56) Documents Cited:
GB 2359848 A **US 5707143 A**
US 5574600 A

(58) Field of Search:
UK CL (Edition V) **F4R**
INT CL⁷ **F21S**
Other: **ONLINE: WPI,EPODOC,JAPIO**

(54) Abstract Title: **Lighting installation with two-part housing**

(57) A lighting installation comprises a main housing (10) which can be secured to a ceiling, wall or floor structure, either recessed into an aperture in the structure or mounted to its surface. A lamp housing (30) is releasably engagable within the main housing (10) by means of a latch mechanism (16) of the "push click fix, push click release" type. A variety of different light bulbs (50) and light transmitting windows (56) can be attached to the lamp housing (30) to provide different lighting effects. These can be assembled prior to installing the lamp housing (30) in the main housing (10). The lighting installation has minimal visual evidence of its method of fixing and provides visual continuity in terms of the structure with interchangeable lighting effects possible by using different lamp housings (30), bulbs (50) and windows (56).

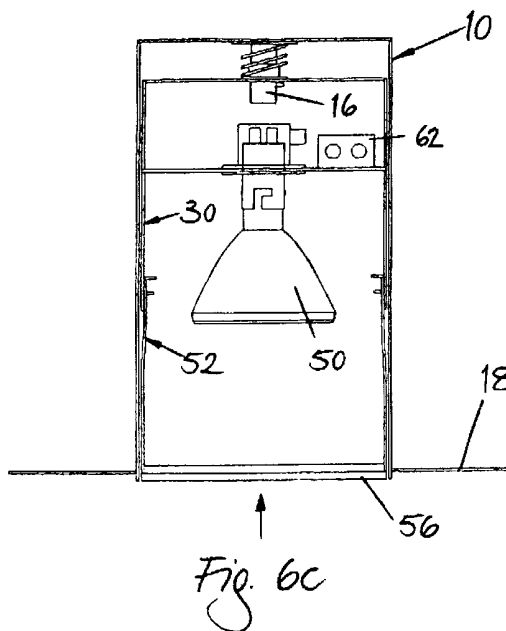


FIG. 1

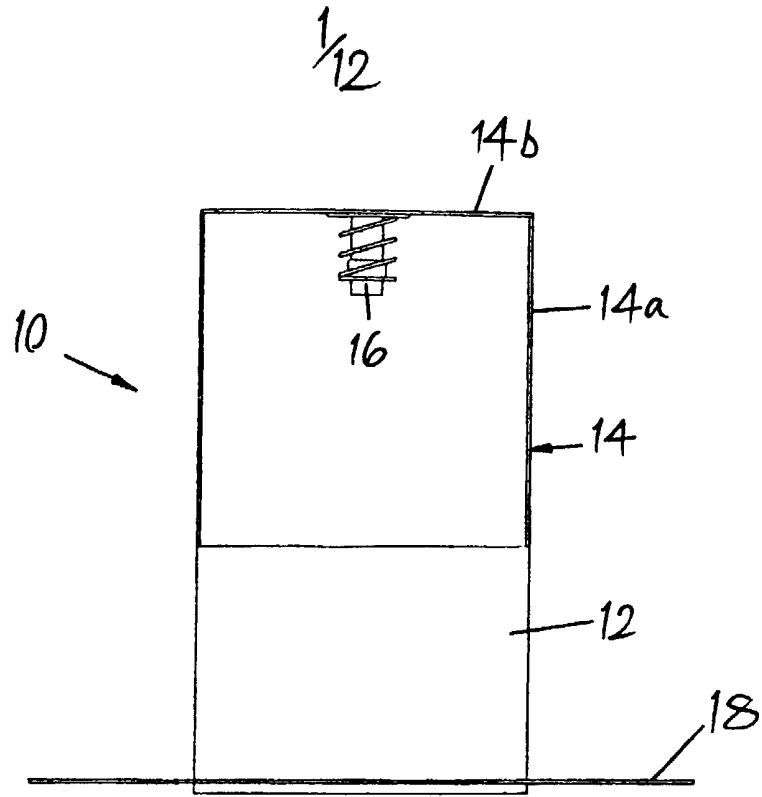


Fig. 1a

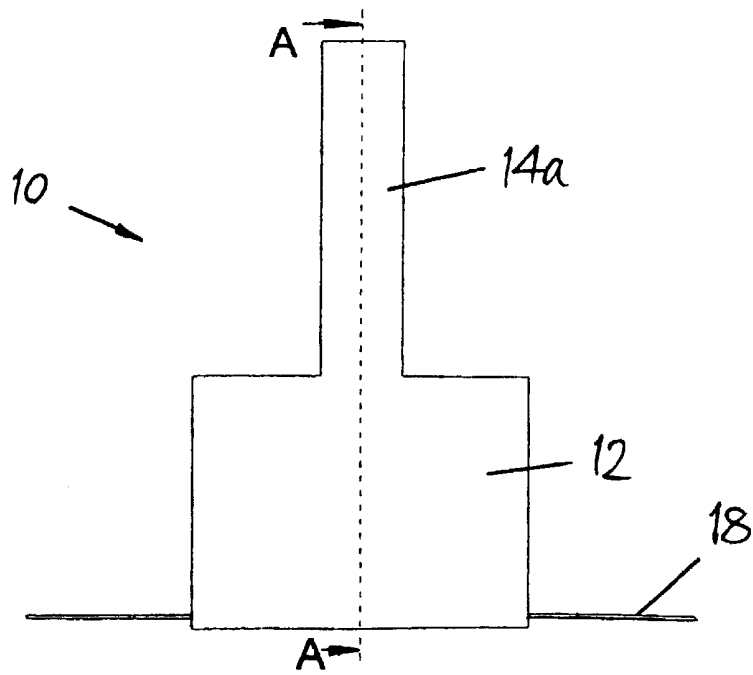
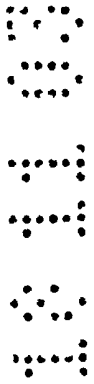


Fig. 1b



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SECTION A:A

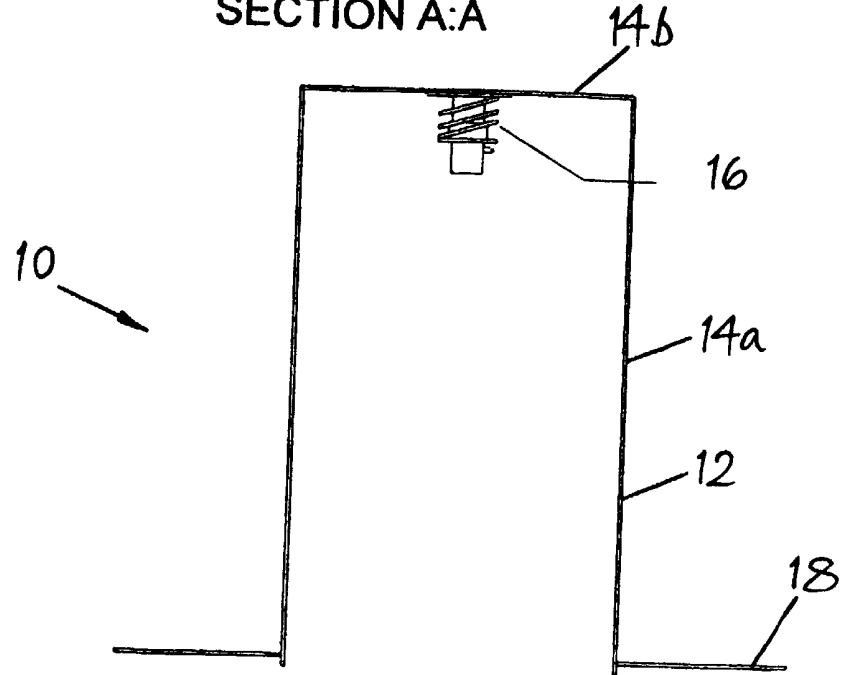


Fig. 1c

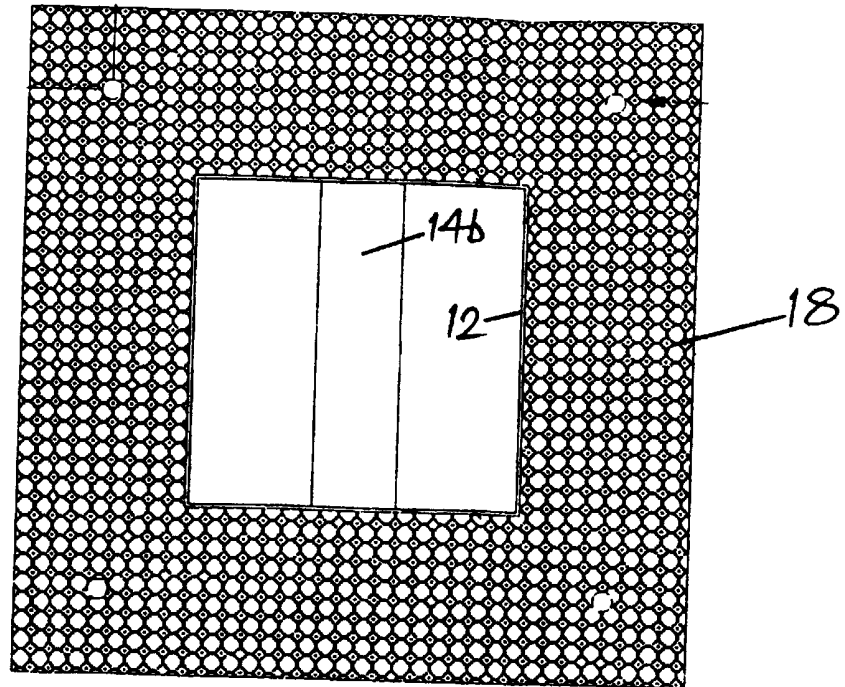


Fig. 1d



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FIG. 2

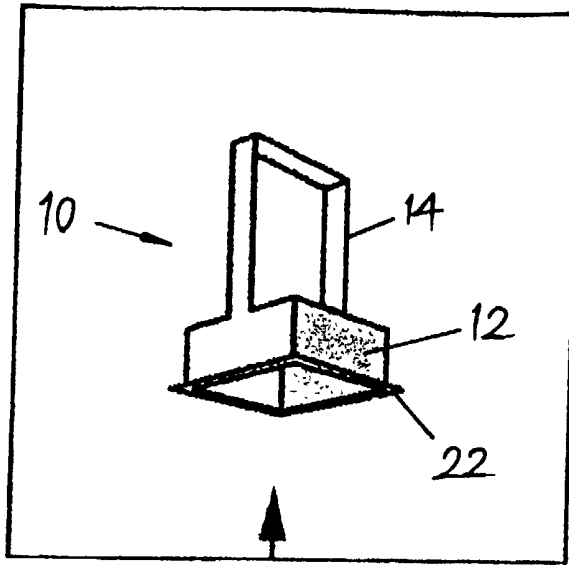


Fig. 2a

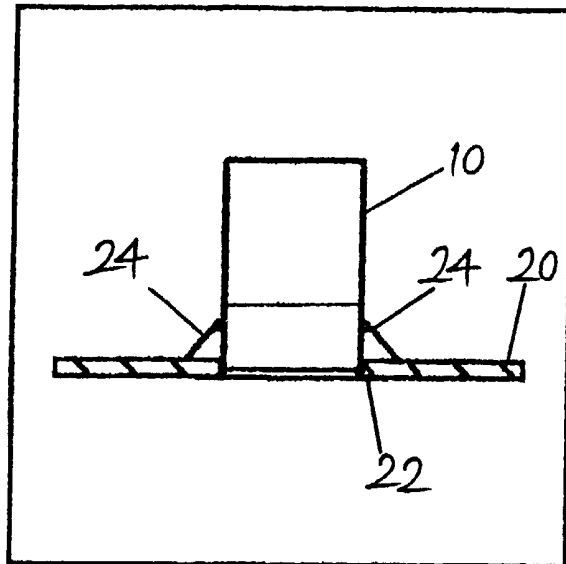


Fig. 2b

FIG. 3

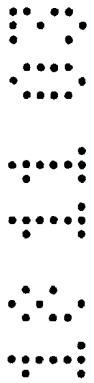
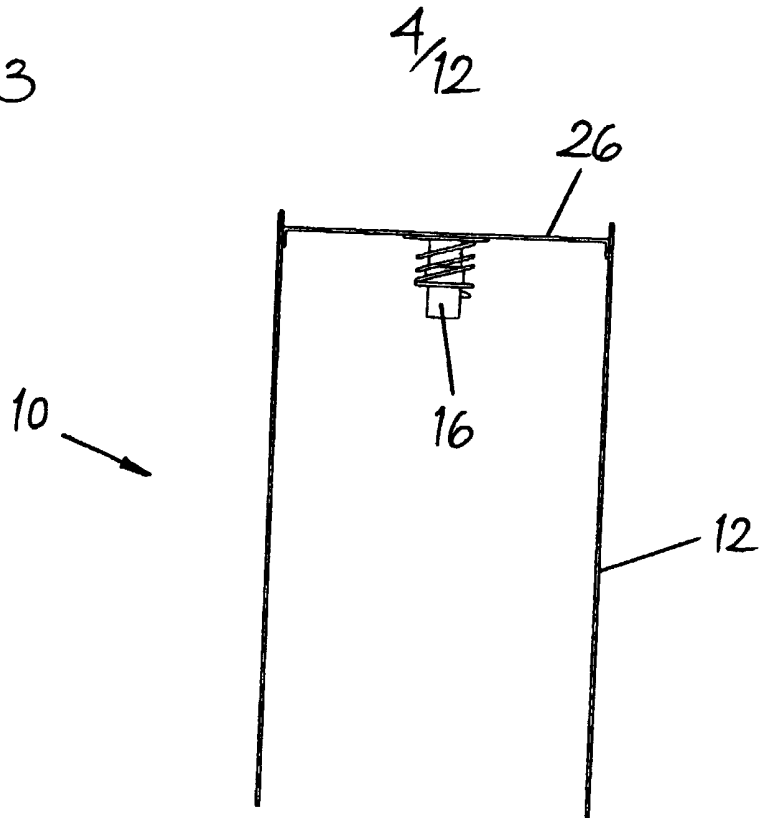


Fig. 3a

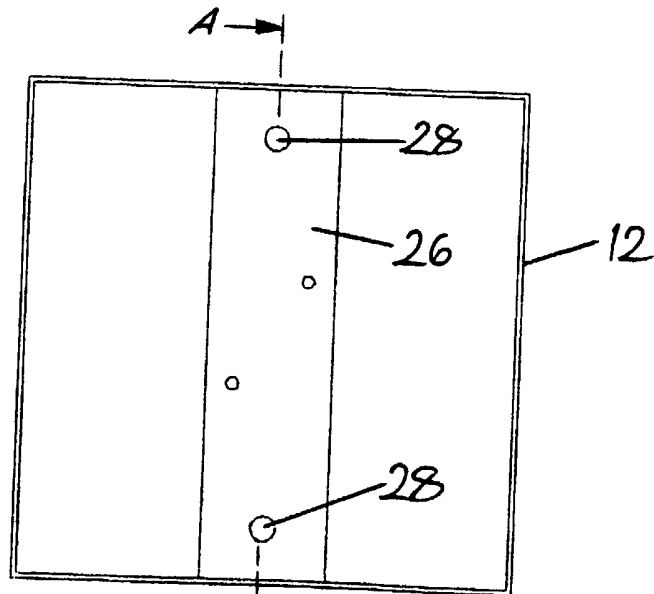


Fig. 3b

FIG. 4

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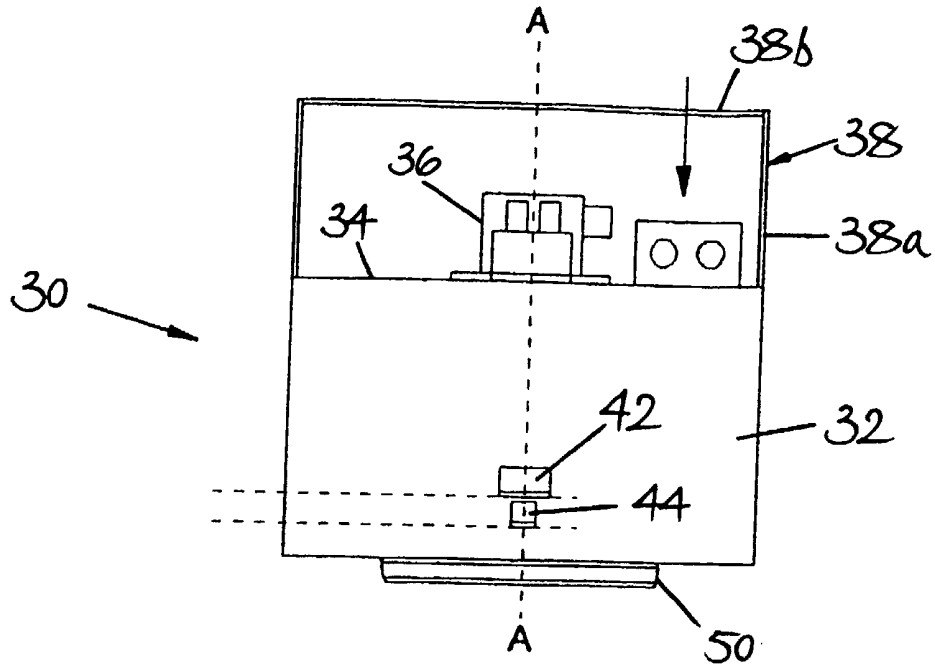


Fig. 4a

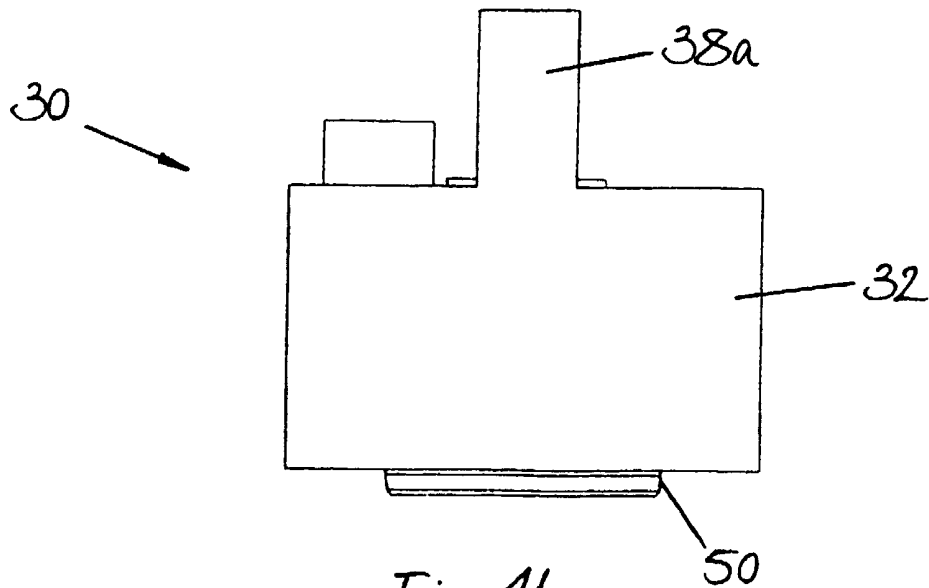
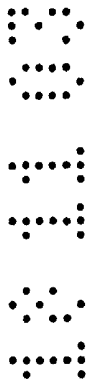


Fig. 4b

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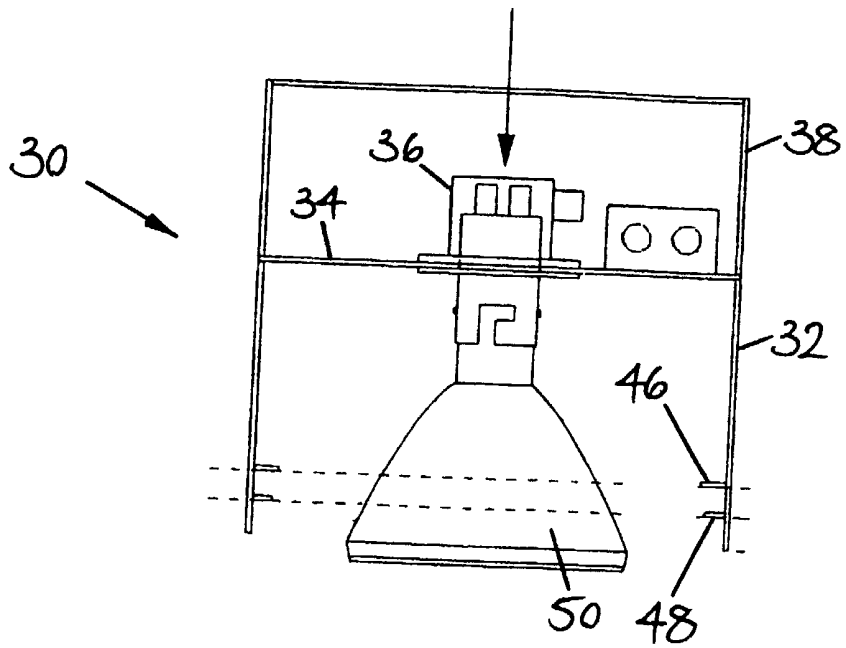


Fig. 4c

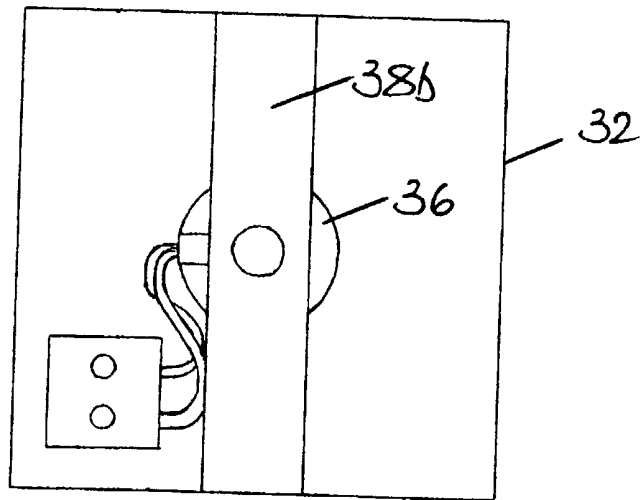
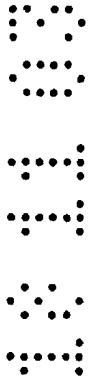


Fig. 4d

FIG. 5

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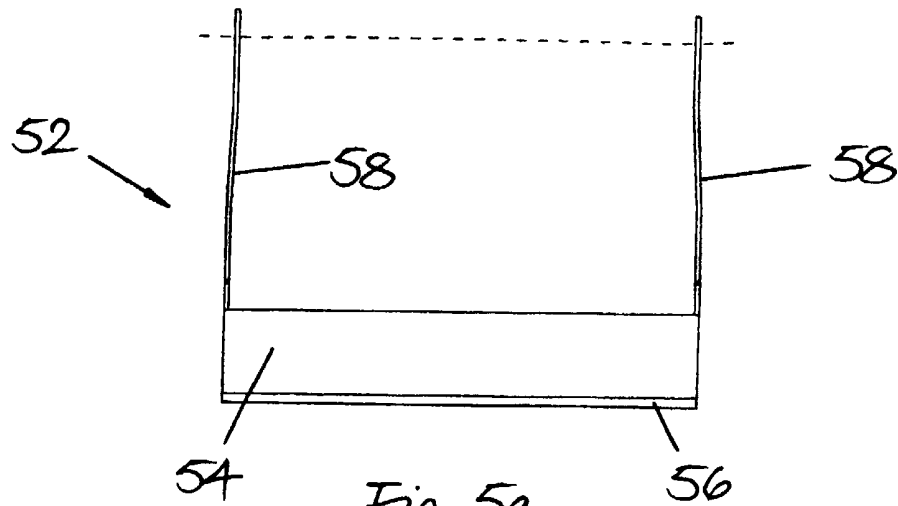


Fig. 5a

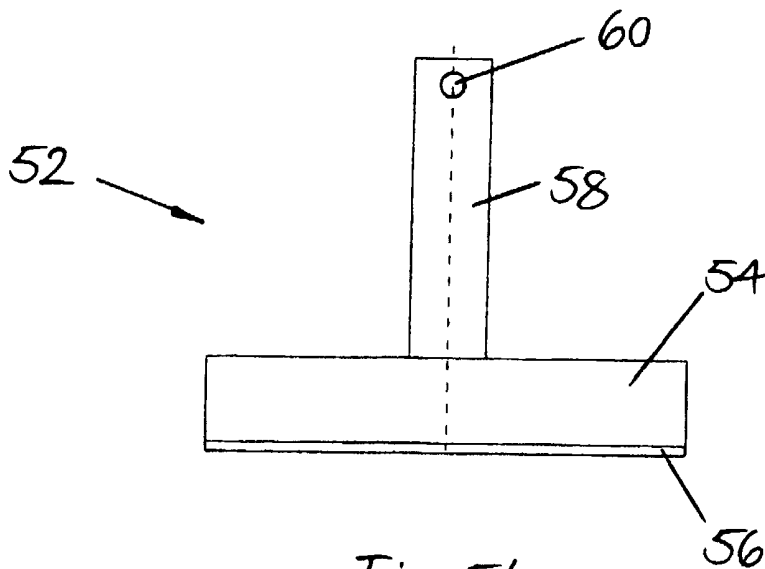
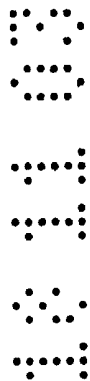


Fig. 5b

FIG. 6

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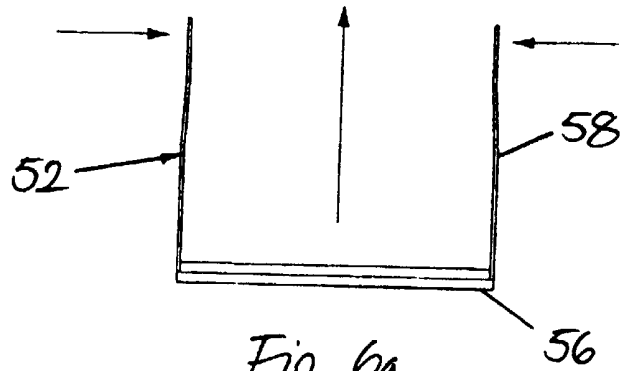
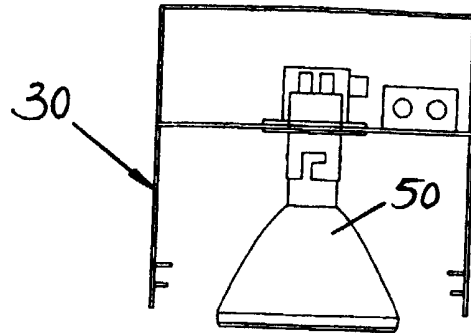


Fig. 6a

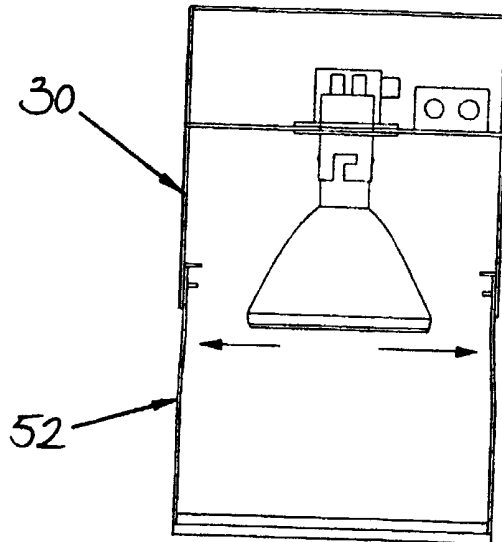
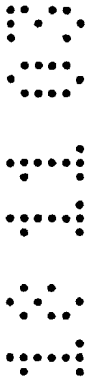


Fig. 6b



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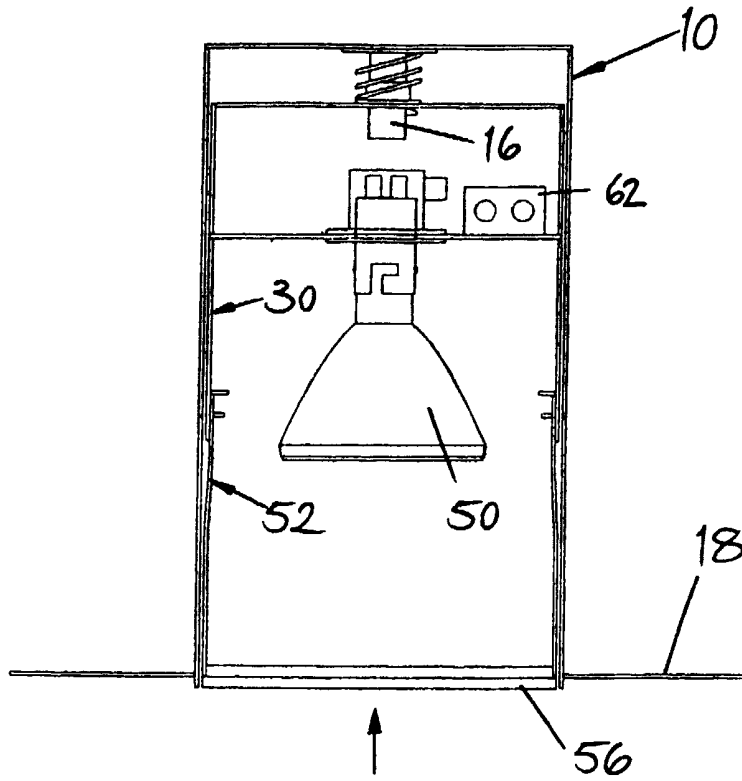


Fig. 6c

FIG. 7

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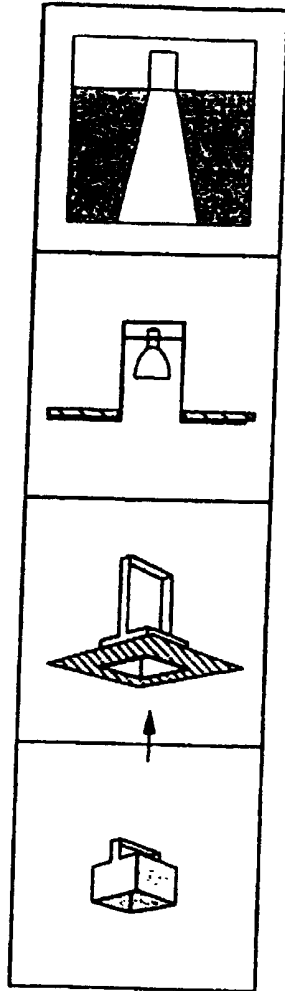


Fig. 7a

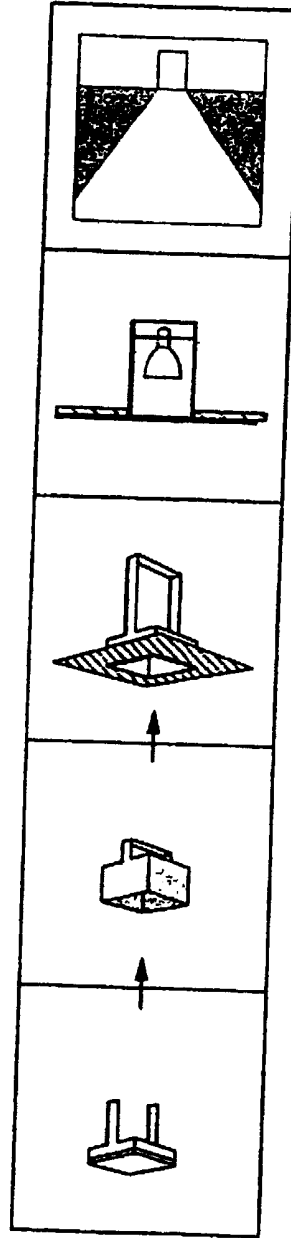


Fig. 7b

FIG. 8

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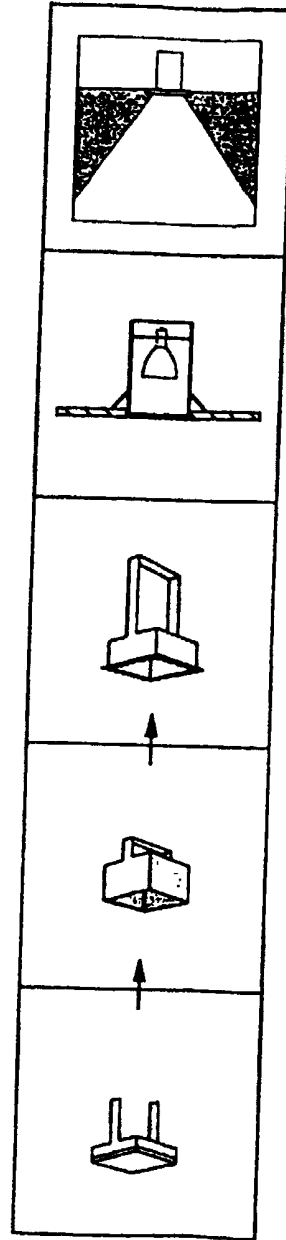
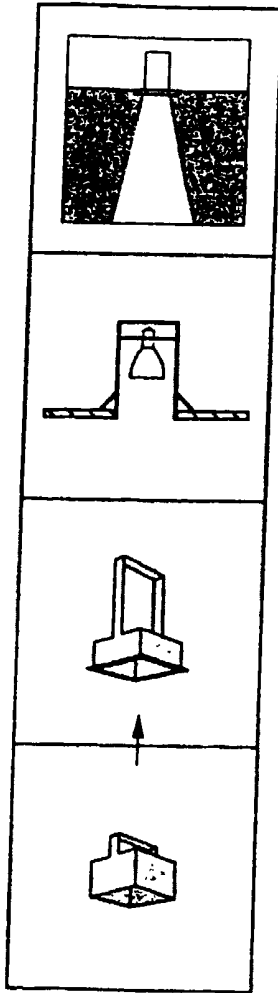


Fig. 8a

Fig. 8b

FIG. 9

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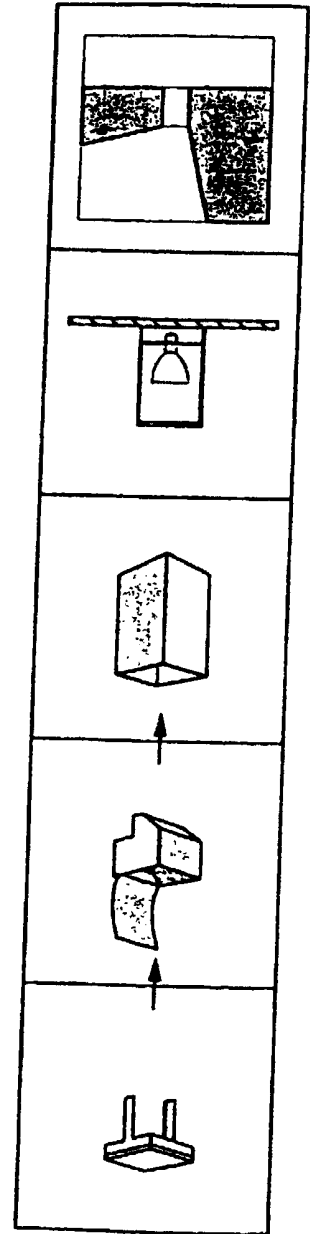
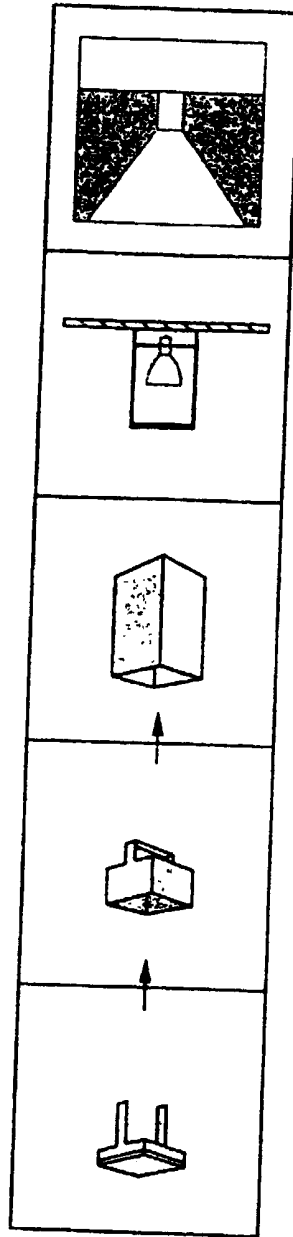
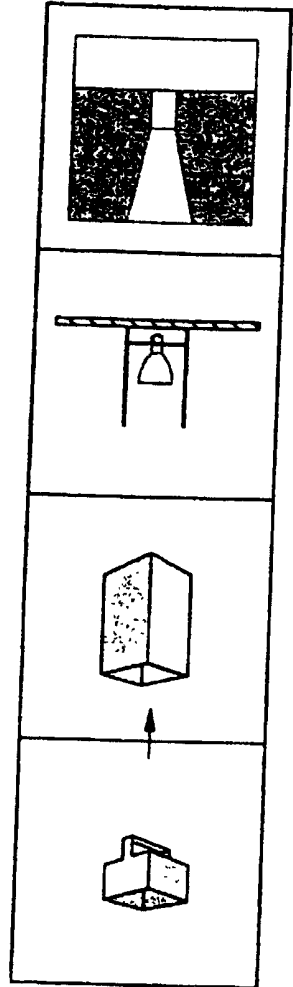


Fig. 9a

Fig. 9b

Fig. 9c

LIGHTING INSTALLATION

The present invention relates to a lighting installation and a method of assembling and
5 disassembling the installation which leaves minimal visual evidence of the fixing method and provides for an interchangeable luminaire which can produce different lighting effects from a common installation.

10 It is known to provide a lighting installation having a frame which can be recessed into a wall or ceiling structure, or secured to the front face of a wall or ceiling, with a light fitting inside the frame. However, the frame is dedicated to a specific
15 type of light fitting giving one particular lighting effect. In addition, it is usually necessary to fit the light bulb directly into the body after the latter has been installed, which can be an awkward and time consuming process.

20 The present invention provides a lighting installation comprising a housing mountable on or in a ceiling, wall or floor structure, a lamp housing for removably receiving a light bulb, and a latch
25 mechanism, operable to allow the lamp housing to engage within the main housing and to be disengaged therefrom, actuated by the application of pressure to the lamp housing in a single direction.

30 Preferably, the main housing comprises a tubular wall, a support for the latch mechanism and mounting means to mount the tubular wall on or in a structure.

The mounting means may comprise a flange
35 surrounding the tubular wall for securing against the surface of a structure.

In one embodiment, the flange comprises a mesh for receiving plaster to bond the flange against the structure.

5 In another embodiment, the main housing further comprises at least one arm hingedly secured to the tubular wall and resiliently biased towards the flange, so as to enable part of a structure to be gripped between the arm and the flange.

10 In yet another embodiment, the mounting means comprises a member extending across at least part of one end of the tubular wall having apertures for receiving mechanical fixing means for fixing to a structure.

15 The lamp housing preferably comprises a tubular wall, a connector for releasably receiving a lightbulb within the tubular wall and means to engage with the main housing to secure the lamp housing therein.

20 The means to engage may comprise a support spanning one end of the tubular wall and having a aperture for receiving the latch mechanism mounted on the main housing.

25 The lamp housing preferably further comprises means to releasably retain a light transmitting window across one end of the tubular wall.

30 The light transmitting window may be mounted in a frame having resilient arms formed with apertures and the means to realisable retain the light transmitting window comprises tongues projecting from the tubular wall of the lamp housing engageable in the apertures.

35 The present invention also provides a method for

assembling and disassembling a lighting installation
of the type described, comprising the steps of:
securing the main housing on or in a structure,
inserting the lamp housing into the frame, applying
5 pressure on the lamp housing in a direction into the
main housing to cause the latch mechanism to engage
the lamp housing with the main housing and, when
required, applying further pressure against the lamp
housing in a direction into the main housing to cause
10 the latch mechanism to disengage the lamp housing from
the main housing and withdrawing the lamp housing from
the main housing.

The present invention will now be described in
15 detail, by way of example only, with reference to the
accompanying drawings in which:

Figure 1 shows a first embodiment of the main
housing of a lighting installation in accordance with
20 the present invention;

Figure 2 shows a second embodiment of the main
housing;

25 Figure 3 shows a third embodiment of a main
housing;

Figure 4 shows a first embodiment of a lamp
housing for use in the main housing;

30 Figure 5 shows a window holder for use with the
lamp housing of Figure 4;

Figure 6 shows stages in the assembly of the
35 lighting installation of the present invention; and

Figures 7, 8 and 9 show examples of the lighting

installation in use providing different lighting effects.

5 Figure 1 illustrates the main housing of a
lighting installation in accordance with a first
embodiment of the present invention. In particular,
Figures 1a, 1b and 1d show front, side and plan views
respectively and Figure 1c shows a cross-sectional
10 view on the line AA of Figure 1b. It will be
appreciated that terms such as front, rear, side, top,
bottom, upper, lower, horizontal and vertical as used
herein are for ease of reference to the Figures and
are not limiting to the actual orientation of the
various parts of the installation in use.

15 The main housing 10 comprises a tubular wall 12
which is shown square in cross-section but could be
circular or any other desired shape. The tubular wall
12 is open at its upper and lower ends. An arched
20 support 14 spans the upper end, made up of two
vertical limbs 14a, joined by a horizontal limb 14b.
A latch mechanism 16, described further below, is
mounted on the horizontal limb 14b projecting
downwardly.

25 An outwardly projecting flange 18 extends around
the lower end of the tubular wall 12 a short distance
above the lowermost edge of the tubular wall 12. As
best seen in Figure 1d, flange 18 comprises a mesh.

30 In use, the main housing 10 is recessed into an
aperture in a structure which may be a ceiling, wall
or even a floor. For ease of reference, in the
following description only a ceiling will be referred
35 to but is to be understood that any desired surface
could be used. The housing 10 is recessed into the
aperture such that the majority of the housing 10

extends above the ceiling but the mesh flange abuts
against the lower surface of the ceiling. Plaster can
then be applied over the mesh flange 18 to secure the
housing 10 in place. When installed, the lower most
5 edge of the tubular wall 12 is flush with the surface
of the ceiling.

Figure 2 illustrates schematically the main
housing 10 of a lighting installation in accordance
10 with a second embodiment of the present invention. In
particular, Figure 2a shows a perspective view and
Figure 2b a cross-sectional view in use. The main
housing 10 has a similar construction to Figure 1 and
accordingly the same reference numerals appear in
15 Figure 2a and 2b where appropriate. However, in this
case the relatively wide mesh flange 18 is omitted and
replaced by a narrower bezel flange 22. In addition,
at least one arm 24 is provided, pivotally attached to
the tubular wall 12 and resiliently biased, for
20 example by a spring, in a direction toward the bezel
flange 22. The latch mechanism 16 is omitted from
Figures 2a and 2b for simplicity.

In use, the housing 10 can be fitted into an
25 aperture in the ceiling in the same manner as Figure 1
with the bezel flange against the lower surface of the
ceiling. The periphery of the aperture in the ceiling
is then gripped between the spring biased arms 24 and
the bezel flange 22 to secure the housing 10 in place.

30
Figure 3 illustrates the main housing 10 for a
lighting installation in accordance with a third
embodiment of the present invention. In this case, the
housing 10 is intended to be mounted directly onto the
35 surface of the ceiling, and not recessed into it.
Figure 3a shows a cross sectional view along the line
AA of the plan view of Figure 3b.

The housing 10 consists of a tubular wall 12, which again is shown square in cross-section but may be of any desired shape. A horizontal cross bar 26 spans one open end of the tubular wall 12, recessed a short distance into the tubular wall 12. The cross bar 26 includes a number of apertures 28 allowing the housing 10 to be fixed to a ceiling with mechanical fixing means such as screws etc. The latch mechanism 16 is mounted on the cross bar 26 extending downwardly into the housing 10.

Figure 4 shows a lamp housing 30 which is received into the main housing 10 in use, as described further below. In particular, Figures 4a, 4b and 4d show front, side and plan views respectively and Figure 4c shows a cross-sectional view along the line AA of Figure 4a.

The lamp housing 30 comprises a tubular wall 32 open at its lower end. It is shown square in cross-section but other shapes are possible. It is dimensioned to fit within the main housing 10 and is therefore usually of the same cross-sectional shape, although this would not be essential. The upper end of the tubular wall 32 is closed by an end wall 34. A bulb connector 36 of known design for receiving a lightbulb 50 is mounted on the end wall 34 projecting downwardly. Typically, the bulb connector 36 will include a conventional bayonet or screw socket for receiving a conventional bulb 50. An arched support 38 extends over the end wall 34, comprising two vertical limbs 38a joined by a horizontal limb 38b. An aperture 40 is formed in the horizontal limb 38b for receiving and engaging with the latch mechanism 16 as described below.

The front and rear faces of the tubular wall 32 have upper and lower apertures 42, 44 formed by folding flaps inwardly to create upper and lower tongues 46, 48 projecting inwardly of the tubular wall 32.

It may be desired to provide a light transmitting window, typically a sheet of glass, across the open end of the tubular wall 32. For this purpose, a holder 52 for the window is provided as illustrated in Figure 5. Figure 5a shows a front view and Figure 5b a side view of the window holder 52.

The window holder 52 comprises a peripheral wall 54 into which a window 56 can be secured, for example by transparent cement or silicone. The cross sectional shape of the peripheral wall 54 is the same as that of the lamp housing 30. Two arms 58 extend upwardly from opposite sides of the peripheral wall 54. Each arm 58 is formed with one or more apertures 60. The arms 58 have some resilience and can therefore be squeezed together at the top, allowing them to be inserted into the lamp housing 30 and the apertures 60 located over the lower tongues 48 in order to attach the window holder 52 to the lamp housing 30. This attachment may be arranged to allow relative positions of the window holder 52 and lamp housing 30 to be adjusted hence positioning the window at various heights with respect to the bulb.

In use, the lighting installation is assembled as described below, with reference to Figure 6. First, the main housing 10 is secured to the ceiling, either recessed into it for the first and second embodiments or attached to its surface for the third embodiment. This can be done during the relatively messy "first fix" stage of construction. Alternatively, for the

second and third embodiments, the main housing 10 can be installed later in the "second fix" stage of construction. Further assembly of the lighting installation can take place in the "second fix" stage to avoid damage or the ingress of dirt and dust into the finished luminaire.

The main housing 10 of all the embodiments is a relatively inexpensive product to produce, stock and supply which assists the lighting manufacturer/distributor/supplier who is able to fulfill orders even for large buildings from an inexpensive stock holding whilst the relevant lamp housings can be ordered to the specific requirements of the building for installation later in the construction process. This minimises the loss of business due to manufacturing or supply lead times.

If a window 54 is required in the finished luminaire, the window holder 52 is fitted into the lamp holder 30 before the lamp holder 30 is fitted in the main housing 10. Accordingly, this can be done at another location and at a different time, depending on what is convenient. As shown in Figures 6a and 6b, the arms 58 are squeezed together and inserted into the lamp holder 30. The arms 58 can then be released into engagement with the lower tongues 48. In this position, the uppermost edges of the arms 58 abut against the undersides of the upper tongues 48 allowing force on the window holder 52 to be transmitted to the lamp housing 30.

The lamp housing 30 and window holder 52 subassembly can now be inserted into the previously installed main housing 10 as shown in Figure 6c. Initially, the horizontal limb 38b of the arch 38 of the lamp housing 30 will contact the latch mechanism

16. The latch mechanism 16 is of the "push click fix,
push click release" type. That is, pressure applied
against the latch once causes it to click into
engagement. Further pressure against the latch in the
5 same direction causes it to click into disengagement,
with no additional actions or movements necessary to
engage or disengage to the latch.

Thus, upward pressure on the lamp housing 30 and
10 window holder 52 subassembly as indicated by the arrow
in Figure 6c causes the latch mechanism 16 to engage
and retain the subassembly within the housing 10.

To disassemble the installation, pressure on the
15 subassembly in the same upward direction will cause
the latch mechanism to release and allow the
subassembly to be withdrawn from the main housing 10.

Electrical power may be provided to the lightbulb
20 50 in any convenient manner. For example, when the
main housing 10 is installed, a trailing wire (not
shown) connected to the mains supply may be provided,
with an end connector. The wire may be pulled down
out of the main housing 10 and connected into a mating
25 connector 62 on the lamp housing 30 to which the bulb
connector is wired, just before the lamp housing 30
and window holder 52 subassembly are inserted and
latched into the main housing 10. Alternatively, the
bulb connector 36 and the latch mechanism 16 may be
30 configured to physically engage with one another to
allow for transmission of power therethrough to the
bulb 50.

In this way, the fitting of an appropriate bulb
35 50 and window 56 to give a desired lighting
performance can be dealt with before the subassembly
is attached to the main housing 10, which is more

convenient and efficient. A variety of luminaires can be provided by altering the type of bulb, window and even the shape and reflectivity of the lamp housing 30, provided the basic dimensions of the lamp housing 5 30 are suitable for insertion in the main housing 10. This means that visual continuity, in terms of the basic structure of the luminaire, can be provided throughout a building but with different luminaires giving different lighting effects in different areas. 10 As the usage of the building changes over its life, different types of lamp housings with various bulbs and windows can be interchanged in various main housings 10 to give the desired lighting performance.

15 Examples of the different lighting effects which can be achieved with the present invention are illustrated in Figures 7 to 9. Figure 7 shows the first embodiment, with the plaster-in mesh- flange housing 10. Figure 7a shows a narrow downlight effect and 20 Figure 7b shows a wider angled downlight effect produced by use of an etched glass window. Similarly, Figures 8a and 8b, and 9a and 9b, show the same effects achieved with the second and third embodiments of the invention. Figure 9c shows a wall wash effect 25 produced by a specially shaped lamp housing which directed light from a ceiling mounted installation towards a wall.

It will be appreciated that the present invention 30 provides a versatile lighting installation which is simple and efficient to install and to maintain, and which is able to provide a variety of different lighting effects from a common structure. It will be realised at that number of variations and 35 modifications to the precise details described may be made without departing from the scope of the present invention as set out in the claims.

CLAIMS:-

1. A lighting installation comprising a housing mountable on or in a ceiling, wall or floor structure,
5 a lamp housing for removably receiving a light bulb, and a latch mechanism, operable to allow the lamp housing to engage within the main housing and to be disengaged therefrom, actuated by the application of pressure to the lamp housing in a single direction.

10

2. A lighting installation as claimed in claim 1, wherein the main housing comprises a tubular wall, a support for the latch mechanism and mounting means to mount the tubular wall on or in a structure.

15

3. A lighting installation as claimed in claim 2, wherein the mounting means comprises a flange surrounding the tubular wall for securing against the surface of a structure.

20

4. A lighting installation as claimed in claim 3, wherein the flange comprises a mesh for receiving plaster to bond the flange against the structure.

25

5. A lighting installation as claimed in claim 3, further comprising at least one arm hingedly secured to the tubular wall and resiliently biased towards the flange, so as to enable part of a structure to be gripped between the arm and the flange.

30

6. A lighting installation as claimed in claim 2, wherein the mounting means comprises a member extending across at least part of one end of the tubular wall having apertures for receiving mechanical
35 fixing means for fixing to a structure.

7. A lighting installation as claimed in any

preceding claim, wherein the lamp housing comprises a tubular wall, a connector for releasably receiving a lightbulb within the tubular wall and means to engage with the main housing to secure the lamp housing
5 therein.

8. A lighting installation as claimed in claim 7, wherein the means to engage comprises a support spanning one end of the tubular wall and having a
10 aperture for receiving the latch mechanism mounted on the main housing.

9. A lighting installation as claimed in claim 7 or claim 8, further comprising means to releasably retain
15 a light transmitting window across one end of the tubular wall.

10. a lighting installation as claimed in claim 9, wherein the light transmitting window is mounted in a
20 frame having resilient arms formed with apertures and the means to realisable retain the light transmitting window comprises tongues projecting from the tubular wall of the lamp housing engageable in the apertures.

25 11. A method for assembling and disassembling a lighting installation in accordance with any preceding claim, comprising the steps of:

securing the main housing on or in a structure, inserting the lamp housing into the frame, applying
30 pressure on the lamp housing in a direction into the main housing to cause the latch mechanism to engage the lamp housing with the main housing and, when required, applying further pressure against the lamp housing in a direction into the main housing to cause
35 the latch mechanism to disengage the lamp housing from the main housing and withdrawing the lamp housing from the main housing.

12. A lighting installation substantially as hereinbefore described and with reference to the accompanying drawings.

5 13. A method for assembling and disassembling a lighting installation as substantially as hereinbefore described and with reference to the accompanying drawings.

10



INVESTOR IN PEOPLE

Application No: GB 0219295.3
Claims searched: 1-13

14

Examiner: Colin Clarke
Date of search: 26 September 2003

Patents Act 1977 : Search Report under Section 17

Documents considered to be relevant:

Category	Relevant to claims	Identity of document and passage or figure of particular relevance
X	1,2,11 at least	US 5707143 HENTZ see figs
X	1,2,11 at least	GB 2359848 A ILLUMA see esp. fig 6
X	1,2,11 at least	US 5574600 AGRO see figs

Categories

X Document indicating lack of novelty or inventive step	A Document indicating technological background and/or state of the art
Y Document indicating lack of inventive step if combined with one or more other documents of same category	P Document published on or after the declared priority date but before the filing date of this invention
& Member of the same patent family	E Patent document published on or after, but with priority date earlier than, the filing date of this application.

Field of Search:

Search of GB, EP, WO & US patent documents classified in the following areas of the UKC^v

F4R

Worldwide search of patent documents classified in the following areas of the IPC⁷

F21S

The following online and other databases have been used in the preparation of this search report:

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